

National European Research Area Roadmap

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MINISTRY FOR EDUCATION AND EMPLOYMENT
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Introduction

In line with the drive to build a strong European economy capable of competing in an increasingly globalised world, the Europe 2020 Strategy¹, launched in 2010, called for the completion of the European Research Area (ERA) through the Innovation Union Flagship Initiative, thus reconfirming Europe's commitment to the achievement of a unified area where knowledge and information flows freely and where talent is nurtured and knowledge exploited for the benefit of society and the economy. Subsequently, the February 2014 Competitiveness Conclusions² on the 2013 ERA Progress Report called for the Member States to develop an ERA Roadmap at European level by mid-2015 through the European Research & Innovation Area Committee (ERAC) in order to identify and target those top actions which would have the greatest impact and success towards the full realisation and implementation of a fully functioning ERA. Following the adoption of the ERAC Opinion on the European Research Area Roadmap 2015-2020³, a further set of Council Conclusions (May 2015)⁴ on the Roadmap called on Member States to implement the top action priorities identified in the ERA Roadmap through action plans or strategies by mid-2016.

The preparation of National ERA Roadmaps was encouraged and supported by ERAC within the context of Member State ownership, in order to tailor each national roadmap to the realities and priorities of the Member States. Thus while the ERA Roadmap identified EU high level priorities and top actions, it was recognised that national research and innovation systems across Europe have different characteristics and so each Member State can tailor its ERA Roadmap to its own needs. Malta's National ERA Roadmap is a complementary document to the National Research and Innovation Strategy and Action Plan 2020. Malta's R&I Strategy reiterates Malta's commitment to the achievement of a well-functioning European Research Area, recognising that this represents an opportunity to capitalise on the strength of the single market. Therefore, several of the ERA priorities are already echoed in the National Strategy and have been translated into actions which fit Malta's contextual framework. Therefore, in a sense, Malta's R&I Strategy already provided a lot of the context for the preparation of Malta's National ERA Roadmap. Nonetheless, in 2016, the Malta Council for Science and Technology (MCST), the body responsible for the drafting of the Strategy, Action Plan and ERA Roadmap, engaged with key stakeholders and the delegates on the ERA-related groups, to ensure a concerted approach to the development of Malta's ERA Roadmap and to mobilise players towards the forthcoming implementation phase.

¹ Europe 2020: A Strategy for smart, sustainable and inclusive growth – Communication from the Commission, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:2020:FIN:EN:PDF>

² Conclusions on Progress in the European Research Area – Competitiveness Council Meeting, Brussels February 2014 http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/intm/141120.pdf

³ ERAC Opinion on the European Research Area Roadmap 2015-2020, ERAC 1208/15

⁴ Council Conclusions on the European Research Area Roadmap 2015-2020, May 8975/15

Priority 1: Effective national research systems

As the ERA Roadmap states, “effectively designed and efficiently functioning national research and innovation systems responsive to the specific objectives of each individual Member State are central to ERA implementation and the benefit Member States derive from it”. The success of the European Research Area’s implementation depends on the long term commitment of each individual Member State to invest in knowledge-intensive activities such as research, innovation and education.

Background

Malta has a relatively young research and innovation system, the National R&I Strategy 2020 being only the second of its kind. Therefore, certain building blocks of the system are still absent or in their infancy, and need to be consolidated or further strengthened. This led to two of the overarching priorities of the new Strategy being the achievement of a comprehensive R&I support ecosystem and the building of a stronger knowledge base⁵, two priorities that will lead to a more effective national R&I system. Various actions are proposed in the Strategy to achieve this, including increasing the effectiveness of the delivery system through up-scaling, extending and coordinating the level of support provided to business and strengthening evaluation and monitoring; ensuring a seamless chain of support to enterprises and support for internationalisation; as well as investing in human capital and research infrastructures.

The Strategy will be implemented through the National R&I Action Plan, which is in the process of being finalised. The Action Plan contains a list of concrete measures that will contribute to achieving a more effective national research system.

Top Actions & Objectives

Top Action Priority: Strengthening the evaluation of R&I policies and strengthening capacity to enable fuller participation in the European Research Area

As a country with a young history of R&I and R&I policy making, Malta needs to further strengthen its capacity in terms of human resources, infrastructures, support to enterprise, knowledge management, etc., in order to enable a fuller participation in the European Research Area through international collaboration. On the other hand, while Malta’s R&I policy-making history is indeed young, the time is ripe to also start building capacity in appropriate methods for evaluation the impacts of actions and measures already in place, thus strengthening the feedback mechanism into the policy making cycle. A number of measures are proposed hereunder to address these priority issues.

1. Setting up an R&I monitoring mechanism

Through the assistance of the Policy Support Facility, Malta is in the process of setting up a monitoring mechanism for the national R&I system, with the main aim of monitoring the implementation of the Strategy and Action Plan. The report drawn up by Commission appointed experts gives concrete recommendations for the set-up of the actual monitoring mechanism, as well as suggestions and examples for specific key performance indicators to monitor the implementation

⁵ National Research & Innovation Strategy 2020 – Malta Council for Science and Technology, June 2014

of the specific measures in the Action Plan. The monitoring mechanism will contribute to creating shared expectations and a common understanding based upon stakeholders' engagement; accountability of public actions by systematically collecting data on specific actions and main characteristics; the way to track progress and obtain early warning on implementation of actions, and, therefore, to allow policies to be adjusted over time and decide that practices deemed beneficial can be scaled up, redefined and changed; to gather the evidence needed for communicating about the policy; and the building stone for the evaluation of the Strategy and the Action Plan as it provides the empirical basis for evaluation.

2. Better collection of data and information

Tied with the first action of creating a monitoring mechanism, a vital action is improving collection and quality of data necessary for monitoring or evaluation. MCST is therefore working in collaboration with the National Statistics Office, the Ministry of European Affairs and the Malta Chamber of Commerce, Enterprise and Industry to streamline the data collection process and also where necessary to obtain certain data that is currently not available.

3. Schemes and Incentives to support businesses to innovate and encourage business-academia collaboration

A common complaint of the private sector is that businesses need better financial support at the different stages of the innovation process. This is essential in order to leverage more effective private sector investment and efforts in research and innovation. To this end, a number of measures are currently available locally:

- Royalty income from patents (Malta Enterprise)
- Business Start (Malta Enterprise)
- FUSION (MCST)
- Micro Invest (Malta Enterprise)
- Micro Guarantee Scheme (Malta Enterprise)

Malta Enterprise, an entity dedicated to supporting business and attracting foreign direct investment, is also designing other schemes that will further support business to innovate, and is working on closing any gaps between different support schemes. Support for these schemes through Structural Funds is envisaged and discussions in this regard are under way.

4. Incentives to achieve a stronger knowledge base

Highly-qualified human resources are fundamental to the development of an effective national system. Creating attractive jobs for local researchers is also one way of addressing the threat of brain drain. Public investment is therefore focused on simultaneously investing in human resources and research infrastructure, in order to attract and retain doctoral students and post-doctoral researchers. To this end, in 2015, Government launched post-doctoral grants (Reach High Scholars Programme) in order to encourage research projects and create attractive posts for researchers. This latest grant scheme builds on several other grant schemes which have been made available over the years to support undergraduate, postgraduate and doctoral studies.

The University of Malta is also proposing the development of a Post-Doctoral Incubator Complex which will act as trans-disciplinary research incubator. The aim of this is to enhance the facilities on

the University of Malta campus necessary to foster a competitive and sustainable knowledge based economy.

Similarly, the Malta College of Arts, Science and Technology (MCAST) is widening its portfolio and building solid grounds in Research and Innovation. It is developing further internal research capacity to meet the demands of Government and added value industry. Through its role as the leading provider of vocational training in Malta, MCAST enables academics, students, and industrial stakeholders to identify gaps and conduct research with the aim of developing tangible solutions.

Priority 2 A: Jointly Addressing Grand Challenges

The Grand Challenges approach to R&I policy making in Europe marked a renewed drive towards European R&I policy based on alignment of funding programmes, addressing common concerns, extending cooperation beyond Europe's borders and focussing on improving society through the impacts of research. There is a strong effort towards joining up of national efforts and funding programmes and the alignment of research agendas to address the challenges more effectively. This is underpinned by the adoption of more transdisciplinary approaches and attention to social sciences and humanities.

As a forerunner of integrated policy approaches which are critical for small countries, Malta supports this drive while ensuring that this policy of common approaches and agendas is well balanced with its smart specialisation strategy, which is intrinsically a policy of differentiation. Therefore, Malta is keen to make its contribution to the various initiatives underway which relate directly to its areas of national priority and interest.

Background

With the launch in 2014 of the national smart specialisation strategy as part of the National R&I Strategy, the need to rethink the internationalisation approach became apparent, in an effort to dovetail various policy strands together.

The National R&I Strategy 2020 highlights the importance of international cooperation and joint programming and recommends consideration of future policy action in these areas. The review of participation in transnational cooperation initiatives undertaken by MCST in 2015 aimed at developing a more strategic approach to support the implementation of the international dimension of the recently launched National Strategy for Research and Innovation 2020. The current approach to participation in European strategic initiatives in particular the Joint Undertakings and Joint Programming Initiatives is based on the need to align closely with the priorities of the National R&I Strategy and to support the smart specialisation areas (RIS 3).

The rationale for the current internationalisation drive is thus related to concentrating efforts on the areas of smart specialisation and more broadly capacity-building efforts outlined in the National R&I Strategy. A highly selective approach has been adopted in relation to participation in European strategic initiatives, including the Joint Programming Initiatives and Joint Undertakings.

Malta has been following policy developments in relation to a number of European collaborative strategic initiatives relating to joint undertakings and joint programming initiatives. In the case of Joint Undertakings, Malta has been active in IMI 2 JU, Clean Sky 2 JU, and ECSEL JU (the follow-up to ENIAC JU). Maltese researchers have participated in projects funded under Clean Sky 1, ENIAC JU, SESAR JU and Eurostars. Participation in the ENIAC Joint Undertaking was made possible through an ad hoc allocation of €2m of national funding in 2013.

In the case of joint programming, Malta became a founding Member of the JPI Urban Europe, through Transport Malta, in 2010 and remained a member until 2014. During 2012 and 2013, Malta acquired observer status in JPI HDHL, JPI AMR, and JPI Oceans. Although JPND does not recognize 'observer' status, it has welcomed Maltese delegates to attend past Management Board Meetings.

Initially participation in the Joint Programming Initiatives was to focus on JPND and JPI Oceans, since these initiatives are clearly in line with the National R&I Strategy and the smart specialisation priorities. However, due to resource constraints and the timing of the calls, a decision was taken to focus on strengthening participation in JPI Oceans. This is also due to the higher level of interest on the part of local stakeholders in this initiative.

To date, there has been no participation by Maltese entities in any of the JPIs' calls for proposals, although researchers are participating in a Joint Action launched by JPI Oceans. Apart from being represented on the different JPI Boards, Malta participates in the GPC. Malta is also participating in two EraNets and has made funding available for local participants (<http://mcst.gov.mt/all/ri-funding-unit/international-programmes/previous-calls>).

Top Action & Objectives

Top Action Priority: Improving access to the Joint Programming Process and the resulting initiatives (e.g. Joint Programming Initiatives (JPIs), Art. 185s) and further supporting participation.

A crucial factor which restricts wider and deeper participation in the joint programming initiatives and Article 185 initiatives is the limited number and scale of local R&I funding programmes and their specific focus on a range of thematic priorities reflecting Malta's smart specialisation areas, which may or may not be reflective of European Grand Challenges. In addition, these programmes are designed to address specific weaknesses in the national R&I ecosystem, such as the initial emphasis on capacity-building and the current focus on commercialisation.

Other factors have an impact on Malta's participation, such as the particular design and participation rules, which can vary a lot from one joint programming initiative to another. However, with the recent steady increase in national R&I funding and the current drive to support smart specialisation, it is envisaged that this could change and efforts could focus on this as a way forward. Apart from resource constraints, it is important to underline the fact that in a small country, other constraints come into play, including limited capacity and facilities and gaps in both which are still being addressed. The proposed measures seek to address a number of the issues which hinder fuller participation.

1. PluMTri

The online web-based portal PluMTri (Platform for Maltese Research and Innovation) plumtri.org will be used to ensure more effective and targeted dissemination of information on the Joint Undertakings, Joint Programming Initiatives, COST and H2020 to the relevant stakeholders. The aim is to progress towards the setting up of online communities for each of the initiatives Malta is active in and thereby provide easier and faster access for local stakeholders to relevant information and contacts.

2. Strengthening Participation in JPI Oceans

Strengthening participation in JPI Oceans will be undertaken by mapping the full range of local stakeholders with an interest in this initiative in the public and private sectors and securing resources for effective participation. The aim is to define a more strategic approach to participation.

3. Active Participation in Joint Undertakings

In line with national priorities, Malta will continue to support active participation in the following Joint Undertakings: Clean Sky 2, ECSEL JU and SESAR JU. The ongoing participation in Eurostars 2, EUREKA and EEN in collaboration with Malta Enterprise will be strengthened.

Priority 2 B: Making optimal use of public investments in RIs

The term 'Research Infrastructures' (RIs) in the case of a small country like Malta, refers to the provision of research facilities, resources and related services on a far smaller scale than envisaged as the norm at European level. This is due to a combination of space, capacity and resource limitations. For a small country, open and affordable access to European and international large scale research infrastructures is particularly important in order to provide researchers with the opportunity to conduct top-level research in their respective fields with their international peers. Malta fully supports the European Commission's drive to support Member States to pool resources and develop (or upgrade) infrastructures of pan-European interest that stimulate scientific excellence and place European research on the international map. Malta is actively engaged in discussions at EU level focused on RIs, primarily through the ESFRI and ERIC Committees.

Background

Malta has secured active participation in two pan-European RIs falling within the ESFRI Roadmap: BBMRI ERIC (under Biological and Medical Sciences) and DARIAH ERIC (under Social Sciences and Humanities). The University of Malta contributes to these fora through financial resources, facilities, and in-kind contributions. Interest has also been shown by different stakeholders to participate in the CLARIN ERIC, SHARE ERIC, PRACE RI and ECRIN ERIC. However, further involvement has been difficult to achieve due to a lack of human and financial resources. One main aspect that needs to be considered in accessing the majority of RIs is the obligation for participants to pay a membership fee that can prove prohibitive for many local organisations. This may or may not need to be supplemented by further financial or in-kind contributions to participate in the activities of the RI. While keeping abreast with participation in RIs related to the ESFRI Roadmap, work has also been undertaken to support participation of local researchers in RIs not included in the ESFRI Roadmap. In 2014, access to the Diamond Light Source stations I19 and I11 in Oxfordshire was supported through an RI pilot scheme launched by MCST. Participation in other RIs falling outside the ESFRI Roadmap includes the partnership established between Malta's national research and education network (NREN) and the GÉANT project. Furthermore, Malta signed a co-operation agreement with CERN in 2008. Subsequently, scientific and technical collaboration between the University of Malta (UoM) and CERN started in the fields of physics, engineering and information and communications technology. Students from Malta have also had the opportunity to participate in the CERN Summer Student Programme.

In recent years, Malta implemented several investment projects related to the development and/or upgrading of research infrastructures including University and MCAST laboratories and the marine hatchery at the Malta Aquaculture Research Centre. A number of these initiatives have drawn on a combination of the European Regional Development Fund and public funding. It is estimated that a total of € 45.7m of ERDF funding has been allocated from the 2014-2020 programming period, for

the development of public research infrastructure, equivalent to about 64 % of the total ERDF allocation for R&I (MEAIM, March 2015). This is the highest percentage allocation of any EU country, and is four times the EU28 average. Key infrastructural developments include the Malta Life Sciences Park, TEMARA (aviation) and Digital Hub infrastructures which support health (pharmaceuticals) and ICT-themed R&D.

Top Action & Objectives

Top Action Priority: Strengthening the national RI landscape as a first step towards ESFRI priorities and criteria taking full account of long-term sustainability

Malta's current priorities relating to research infrastructures are outlined in the National R&I Strategy 2020, which highlights the need for investment in research infrastructures as an essential element for strengthening the local knowledge base. These investments are to focus primarily on the national areas of priority as defined in the smart specialisation strategy. The International Review undertaken by MCST in 2015 recommended that MCST support access to RIs aligned with the goals of the National R&I Strategy 2020. However, the current RIs under the ESFRI Roadmap often fall outside the scope of the Smart Specialisation Areas outlined in the National R&I Strategy 2020. This together with the limited funding available at a national level, restricts participation in ESFRI.

As in previous years, Malta will continue to earmark a significant amount of ERDF funding for developing local research infrastructures. The main indications of future ERDF investments in local research infrastructures include:

1. Malta Aquaculture Research Centre

The Malta Aquaculture Research Centre is earmarked in the operational programme for the European Maritime and Fisheries Fund (MEAIM, March 2015). The Government of Malta is proposing to set up a public private partnership (PPP) that would include a commercial scale hatchery that can be used for a number of marine species such as amberjacks and blue-fin tuna, as well as research facilities to replace those available at Fort San Lucjan. The current hatchery has reached its maximum capacity and unless an investment is made in this regard, the sector will not be able to maintain its current competitive position in the Mediterranean region.

2. Investments in the Health Sector

The Health sector is earmarked for support through the next ERDF operational programme (MEAIM, March 2015). The Innovation Centre of Excellence – Blood, Tissue and Cells (ICE-BTC) to be set up by the Ministry of Energy and Health will focus on translational research and innovation (blood, tissue and cells centre) in the biomedical area. The Research Centre of Excellence in Molecular Medicine and Biobanking, based at the University of Malta, in close proximity both to Mater Dei and the Life Sciences Park, will focus on both basic and applied research in the area. Both investments aim to promote business investment in R&I, develop synergies and strengthen competitiveness of the private sector through R&D&I and provide specialised training for docs and post docs (OP priorities for PA I).

3. The National Aerospace Centre

Malta is currently investing in the setting up of a dedicated centre of excellence, the National Aerospace Centre (NAC), to enhance Malta's profile in the aviation industry. The Ministry for

Tourism published Legal Notice 68/2014 for the legal constitution of the NAC as a technical centre of excellence, business-driven, economically viable entity, operating as an Aerospace Research Development and Innovation centre in strategic technology areas of value to national industry and European competitiveness. Malta recently secured funding for the pre-phase of setting up the NAC through the H2020 Teaming Programme, TEMARA, which started in June 2015 and involves collaboration between the Dutch National Aerospace Laboratory, the Malta Ministry for Tourism (responsible for Aviation) and the Malta Council for Science and Technology.

Priority 3: An open labour market for researchers

An open labour market for researchers is an important priority at the European and national level. For small, peripheral countries of Malta's size, there are a number of realities and challenges which are faced in addressing this priority.

Background

In a small economy, the supply of qualified human resources, in particular researchers, is especially critical given the lack of other resources and restricted framework conditions. The small scale of the research and innovation ecosystem has an impact on research and innovation capacity and activity and necessarily reduces the range of research and innovation areas which are addressed to a smaller sub-set. Priorities are primarily geared to the National Research and Innovation Strategy 2020 and the smart specialisation strategy elaborated therein.

There is thus a dual challenge of ensuring sufficiently attractive employment conditions to both retain local researchers in the country and to attract appropriately qualified researchers from other European (or other) countries. The reality that we are often faced with is that our best researchers often take up more promising research careers in their areas of specialisation overseas and it is difficult to attract them back to Malta. Moreover, local employment opportunities and conditions for researchers are often not conducive to attracting the best researchers from abroad. Recent efforts to improve our research funding opportunities, infrastructure and working conditions, are helping to alleviate this, and it is envisaged that ongoing research infrastructure and capacity building initiatives will further improve the situation.

The capacity-building measures have included support for doctoral studies including the Malta Government Scholarship Scheme – Postgraduate (MGSS-PG) launched in 2006, which assists exceptional applicants through sponsored studies in Malta and abroad to contribute towards research in identified areas of national priority and increase the capacity and level of research, innovation and development activity in Malta. The Strategic Education Pathways Scholarship Scheme (STEPS) launched in 2009, co-funded by the European Social Fund, supports Masters or Doctoral degree studies in Malta or abroad in the areas of science and technology and information and communications technology. More recently in 2015, the Ministry of Education and Employment launched a third scheme the Reach High Scholars Programme supporting post-doctoral research in any higher accredited institution in the EU or EEA. The aim is to continue to extend these schemes in the next round of Structural Funds up to 2020.

Top Action & Objectives

Top Action Priority: Using open, transparent and merit-based recruitment practices with regard to research positions

Our main objective is to continue to build on and consolidate the initiatives outlined above, by introducing a number of actions and measures including:

1. Recruitment Practices

The improvement of recruitment practices to ensure more openness and transparency and merit based appointment to research positions will be encouraged in the public and private sector. Efforts

will be made to encourage increased awareness and compliance with the Charter and Code of Conduct; Innovative Doctoral Training principles.

2. Mapping of Maltese Researchers

The mapping of Maltese researchers and their partner organisations abroad through PluMTri remains a priority. This allows a more real-time overview of current capacities, including a breakdown of local and overseas researchers based in Malta. This helps to identify gaps in human resources in research and innovation which need to be addressed.

The enhancement of the Maltese EURAXESS site will be targeted at ensuring that users can access the full range of information, support and services they require. A mapping of users and their needs will be undertaken to ensure that the site is as user-friendly and accessible as possible and that all relevant information is provided in a timely manner.

3. Horizon 2020 support

The H2020 national contact point setup will be strengthened in order to continue to support participation by Maltese researchers in the Marie Skłodowska-Curie Actions. An online community of researchers interested /participating in the Marie Skłodowska-Curie Actions will be set up for sharing information and experiences.

4. Promoting an Open Labour Market for Researchers

The stronger engagement of the private sector in promoting an open labour market for researchers is considered a priority. This will be addressed by encouraging local firms, in particular those with substantial investments in R&I activity, to support this drive. It is envisaged that an information and awareness raising session will be organised annually and that a review will be undertaken to check on compliance.

Priority 4: Gender Equality and Gender Mainstreaming

For the purpose of developing the European Research Area, gender barriers to career progression need to be removed. Unfortunately, in Malta, as in many other countries, the expertise of highly qualified women in science remains insufficiently tapped. Women remain underrepresented in the higher echelons of academic and other leadership positions.

The decision-making bodies of research performing organisations should strive for gender balance. Committees dealing with recruitment and career advancement should increase representation of the underrepresented sex. The gender dimension should also be bolstered in European and national research programmes.

All this, of course, requires Member States to improve the participation of women in STEM subjects and professions in general.

Background

The Global Gender Gap Report issued by the World Economic Forum in 2015 placed Malta in the 104th place out of 142 countries. Malta is seen as having male-female equality in educational attainment and does well in health, but women still lag behind men when it comes to political empowerment, economic participation and opportunity.

Malta's Employment and Training Corporation (ETC) drafted a Gender Equality Strategy and Action Plan in 2009. While it does not specifically address the gender dimension in research, it provides policy guidelines, measures, incentives and targets addressing the gender issues on a general level.

Chapter 456 of the Laws of Malta concerns *Equality between Men and Women* as well as other aspects of equality. A new Equality Act has been drafted and will be shortly presented in Parliament.

With regard to gender in science specifically, meetings bringing together all the main stakeholders have taken place at the Malta Council for Science and Technology and the National Commission for the Promotion of Equality (NCPE).

Available data indicates that women in science remain largely underrepresented in Malta, particularly in senior positions and at decision making levels. Statistics for the University of Malta, which is where most publicly funded research takes place, confirm that higher academic positions are still male-dominated. At Senior Lecturer Level, 39 % are female, at Associate Professor Level, 34 % are female and at Professor Level 16 % are female.

Nevertheless, the situation appears to be steadily improving, as shown by 2015 "She Figures" data pointing towards a positive evolution in the opportunities of female researchers. Family-friendly measures have also greatly improved (e.g. extension of maternity leave allowance, introduction of additional free childcare centres, tax credits for those using private childcare centres, and tax credits for women returning to work after an absence of five years or more). However, while these are very important, family responsibilities are just one factor hindering the participation of women in science. However, family commitments are only one of the factors which impact on the participation of women in science. Other factors such as gender roles and stereotypes are equally important. To this

end, the National Commission for the Promotion of Equality (NCPE) has launched several projects (e.g. "Equality Beyond Gender Roles") aimed at fighting such gender roles and stereotypes, which often result in women being expected to choose between having a family and furthering their careers.

Top Action & Objectives

Top Action Priority: Translating equality legislation into effective action to address gender imbalances in research institutions and decision making bodies and integrating the gender dimension better into R&D policies, programmes and projects

Due to its size and history, Malta has very few research performing organisations. Most research is done at the University of Malta, Malta's only public University. About five years ago, MCAST launched MQF/EQF Level 6 courses and will be launching MQF/EQF Level 7 in October 2016, thus starting to produce Masters-level research. Other research performing structures such as the Malta Aquaculture Research Centre or other competence centres are still so small that it is difficult to assess their gender structure at present.

The University of Malta has had a Gender Issues Committee since 1991. Its mission is to advise the University Council on issues relating to gender equality. The Committee works on several areas including the identification of sources of unequal opportunities or treatment with respect to gender and has also taken several initiatives in this regard. The Gender Issues Policy can be accessed online (http://www.um.edu.mt/__data/assets/pdf_file/0008/46466/policy.pdf).

MCAST does not have a specific committee dealing with gender issues. However, every institute has its research committee that considers amongst others the gender dimension of research. Students' complaints regarding gender discrimination are referred to the Student Support Coordinators while staff complaints regarding gender discrimination are referred to the Human Resources Department. While no formal policy on gender equality and mainstreaming in research exists, gender is taken into consideration by default when drafting curricula and in the general running of the college.

As the main government funding agency for R&I, MCST also has a role to play in raising awareness on the gender dimension of research. Over the years MCST has had several working groups on women in science. In 2012, MCST in conjunction with Yellow Window Management Consultants organised a training session on gender in research in Horizon 2020 as part of an FP7 project on the subject. MCST also makes sure there is a gender balance in its Governing Board as well as on recruitment panels.

A number of measures are planned to further promote gender equality in Maltese RFOs and RPOs, as described hereunder.

1. Development of cross-curricular programmes

With the new Foundation College, Technical College and University College structure, MCAST will start exploring and developing cross curricular programmes with the aim of targeting industry needs and employability as well as for the students' holistic education. Through these programmes, units which for example would previously have been associated primarily with males, will be offered in conjunction with other units which may have traditionally mainly attracted females, and vice versa. Thus both males and females will be exposed to topics, knowledge, skills and competences from

various areas, giving them the opportunity to try out different subjects. As a result, females might choose to specialise in areas which were usually predominantly male, and vice versa.

2. Awareness raising and marketing

Public education providers will continue to use role models in their marketing, e.g. photos of female students will be used to promote courses where females are underrepresented, and vice-versa.

MCST's new Explora Interactive Science Centre is making a conscious effort to gender mainstream all exhibition floors. Great care has been put into making all exhibits equally attractive to boys and girls. Where possible, female role models and ambassadors will be used for areas that are traditionally male-dominated (e.g. engineering, space), and vice-versa. Explora is also planning to launch a project, with foreign partners, focusing on the take-up of STEM subjects by children aged 10 and above. One of this project's long-term goals will be that of improving the gender balance among STEM graduates.

3. Improving gender equality in the national R&I funding programme

In the context of the national R&I funding programme, FUSION, MCST is planning to include a question in its application form on whether applicants for grants have considered the gender dimension in their research content as well as in their team structure.

In order to align its policy with Horizon 2020 policy, MCST is also considering making gender one of the criteria to be taken into consideration when breaking a tie between projects that have scored the same number of points in their evaluation.

Gender considerations could also be included in the Ethics guidelines concerning the Technology Development Programme report (FUSION). Also under FUSION, gender could feature in the market research evaluations that take place in the Commercialisation Voucher Programme.

Priority 5: Optimal Circulation and Transfer of Knowledge

Efficient circulation and transfer of knowledge represent the cornerstone of transforming ideas into innovation. This ERA priority focuses on strengthening the link between science and industry and on the role of public-sector research in “open innovation”. As most knowledge creation and transfer uses digital means, all barriers preventing seamless online access to digital research services for collaboration, computing, accessing and disseminating scientific information (e-Science) and to e-infrastructures must also be removed by promoting a digital ERA.

Background

Malta has a Digital Malta Strategy for 2014-2020 that puts forward a set of guiding principles and policy actions on how ICT can be used for socio-economic development.

Malta's National R&I Strategy 2020 published in 2014 noted that the academic sector had developed a more proactive approach in working more directly with business in the area of knowledge transfer, skills development, entrepreneurship and commercialisation. The Strategy stressed that strengthening the capacity of entrepreneurial actors to innovate required improved access to knowledge and improved transfer of knowledge.

A number of measures have been taken by various institutions in Malta to facilitate knowledge transfer, particularly between academia and industry.

In 2009 the University of Malta set up its Corporate Research and Knowledge Transfer Office, which drives the Corporate Research agenda of the University and assists University staff with defining and protecting intellectual property and commercially exploiting research results or seeking funding and collaborative research projects. The knowledge transfer office is working with the corporate arm of the University of Oxford and in 2014 launched a Masters in Entrepreneurship.

The University of Malta has an open source e-learning platform for use by academics, researchers and students. The University is connected to the GEANT education network, thus giving academics and researchers access to digital research services in other countries, and is in the process of joining the eduGAIN identity federation.

In September 2014, the University of Malta Library implemented a number of related measures, including the setting up of the first digital Open Access Institutional Repository (OAR@UoM) in the country. The Library has also drafted an Institutional Open Access policy for the University of Malta, which mandates Green Open Access while supporting Gold Open Access. The University Library is also an active participant in two pan-European projects being OpenAIRE2020 and Pasteur4OA. Moreover, it acts as a National Point of Reference for access to and preservation of scientific information in Europe.

In 2014 the University of Malta completed a project for the development of a supercomputer laboratory for use by academics as well as by research-performing SMEs. This enhances the research potential of the University and facilitates collaboration with industry and the development of a knowledge-based economy. 2014 also saw the launch of the University's TAKEOFF Business Incubator and the TAKEOFF Seed Fund Award. This start-up development space helps innovators and aspiring entrepreneurs create thriving technology and knowledge-based ventures.

MCAST also pursues the objective of strengthening collaborative research and technology transfer, particularly by means of collaborative projects with international industry and academic partners such as Fraunhofer Gesellschaft and Haaga-Helia University of Applied Sciences among others. As Malta's main vocational education and training institution, MCAST designs most of its courses with the input and participation of industry.

Malta Enterprise has a number of schemes that directly or indirectly aim at promoting knowledge transfer. These include seed funding for start-ups (B-start scheme) and tax credits (Get Qualified scheme) for students opting for studies leading to a certificate, diploma, degree or post-graduate degrees within industries such as advanced manufacturing; maritime; energy, oil and gas; and life sciences (including health services and veterinary services). Malta Enterprise also manages schemes relating to IP (e.g. Royalty Income from Patents) aimed at encouraging investment in research and knowledge creation and exploitation of intellectual property.

Malta Enterprise has also set up a new infrastructure (Life Sciences Park), which will host different competence centres and companies active in the field. One of the goals of this hub structure is to break down the silos both within academia, and also between academia and business.

In its management of Malta's national R&I funding programme, FUSION, MCST strongly advocates academia-industry collaboration and knowledge transfer by making it compulsory for industry to team up with a government or academic body in the final stage of the application. Such collaboration is also a central theme of brokerage events organised by MCST on Horizon 2020, EEN, COST and other programmes. The FUSION programme also supports and encourages publication in Open Access. The grant obtained under FUSION can also cover the publication of articles in Gold Open Access journals.

MCST is also actively involved in a number of projects that seek to share and pool knowledge and in 2016 it also launched an online platform called PluMTri, which aims to become a tool for more effective networking.

Top Action & Objectives

Top Action Priority: Fully implementing knowledge transfer policies at national level in order to maximise the dissemination, uptake and exploitation of scientific results. RPOs and RFOs should make knowledge transfer second nature by integrating it in their everyday work.

In spite of the lack of a dedicated national Open Access policy, the percentage of scientific publications which include a Maltese author published in Open Access exceeds the EU average (Archambault et al, October 2014). It is expected that a national Open Access policy and other measures planned, as explained hereunder, will help sustain this trend and improve it further.

1. Development of a National Open Access Policy

The commencement of the development of a National Open Access Policy, in collaboration with all stakeholders and building on the work undertaken to date by the University of Malta is planned to take place over the coming months. The first stages will seek to map the present local resources and needs in this regard in order to chart a way forward.

2. Amending Open Access guidelines in the National R&I Programme

MCST is also looking into amending FUSION guidelines to specify that if a project yields publications, such content must be made available on an Open Access digital repository after an embargo period. MCST will encourage all existing and new research performing institutions to promote Open Access through awareness raising and by supporting participation in FUSION.

3. Actions to promote Knowledge Transfer

MCST's Internationalisation Partnership Awards Scheme, which funds activities that foster mutually beneficial international relationships between locally-based academic researchers and foreign centres of academic excellence based in the EU, will be opened to SMEs in its second edition in 2016-2017, in order to promote academia-business knowledge transfer.

Priority 6: International Cooperation

In a globally dynamic international context, internationalisation is a critical factor in the national drive to enhance and extend research and innovation capacity and competence. This is particularly the case for small countries and regions where the research and innovation ecosystem is in development/transition and lacks critical mass. Since association to the EU's Framework Programme for Research and Innovation, Malta has progressively increased its participation in EU research and innovation activity both quantitatively as well as qualitatively. The impact of participation has led to a number of positive effects in terms of R&I capacity-building, benchmarking and peer learning, and the transfer of good practices.

Background

The National R&I Strategy 2020 supports international collaboration by prioritising efforts to include participation in Horizon 2020 initiatives, on the identified specialisation areas and initiatives with a Mediterranean dimension. With the launch in 2014 of the national smart specialisation strategy as part of the National R&I Strategy, the need to rethink the internationalisation approach became apparent, in an effort to dovetail various policy strands together. Within this context, a detailed review of international cooperation was undertaken by MCST (and completed in early 2014), which gives strategic recommendations on the prioritisation of international initiatives. As a result of this review, a highly selective approach has been adopted in relation to participation in different strategic initiatives. Malta has been active in regional R&I initiatives relating to the Mediterranean area since 1995 as one of the founding members of the Monitoring Committee for Euro-Mediterranean Cooperation in Research and Innovation (MoCo). EU Member States and Mediterranean countries have used this platform to develop strategic recommendations for the joint implementation of shared Euro-Med research and innovation policy priorities.

In recent years Malta has endeavoured to take on a more strategic role in the co-design of effective policies and measures for the Euro-Mediterranean region, primarily through participation in MIRA and the Med-Spring project, which builds on the previous experience of MIRA but focuses on three societal challenges; Energy, Food and Resources.

Top Actions & Objectives

Top Action Priority: Develop and implement appropriate joint strategic approaches for international STI cooperation on the basis of Member States' national priorities

Strengthening individual Member State engagement with third country partners through a strategic approach, will contribute to Europe's objective for effective, coherent and sustainable international cooperation. Malta's National R&I Strategy aims to foster stronger cooperation with third countries, and also with other EU Member States and Associated Countries. Malta's objective is to adopt a strategic approach in selecting high impact collaborations with EU Member States, Associated Countries and Third Country Partners linked to its thematic priorities identified through smart specialisation.

1. Regional Initiatives in the Mediterranean Area

Malta is currently partner in two EraNets – ERANET-MED and ARIMNET II. ERANET-MED targets renewable energy and water resources while ARIMNET II is focused on the field of agricultural research. Through its participation in the ERANET-Med project, Malta is also involved in the PRIMA initiative (Partnership in Research and Innovation in the Mediterranean Area) which is currently under consideration as a possible Article 185 Initiative. If successful, PRIMA will establish permanent collaboration among Member States and countries in the Mediterranean region. PRIMA will address topics relating to food systems and water resources, touching on several other thematic areas including health, climate change, energy, biodiversity, coastal sea management and agriculture. It is of strategic importance for Malta to engage in transnational research and innovation efforts that tackle the societal challenges of the Euro-Mediterranean region. For this reason, Malta has been a proactive member of the PRIMA consortium since its inception and will be championing this initiative as its foremost research-related priority throughout its tenure as President of the Council of the EU. It is hoped that this initiative will be launched as an Article 185 initiative, making this the second instrument of this kind that Malta would be engaged in apart from Eurostars 2. Malta is committing half a million euro annually for participation in PRIMA.

2. Bilateral R&I Agreements with China

The Governments of Malta and China agreed in the MoU on a *Medium-Term Cooperation Plan (2014-2019)*, signed in July 2014, to re-activate a 2002 bilateral Agreement on Scientific and Technological Cooperation. MCST and the Ministry of Science and Technology (MoST) in Beijing are the designated implementing agencies for the cooperation. The first Joint Commission meeting between MCST and MoST was held in Malta in August 2015. A MoU between MCST and MoST outlining the consideration to the proposal of a *Malta-China Joint Research Laboratory in Aquaculture* ("Joint Research Laboratory") was signed by the two parties. Aquaculture is one of Malta's smart specialisation areas. The Maltese Ministry for Sustainable Development, the Environment and Climate Change (MSDEC). MSDEC and a Chinese entity appointed through MoST, will collaborate through a two-stage project involving firstly desktop research activities on closed-cycle farming and hatcheries, followed by a possible stage two which would see the development of a joint lab between the two entities in Malta.

3. Participation in KENUP consortium

One of Malta's smart specialisation areas is health, with a focus on healthy living and active ageing, and e-health. Malta, through MCST, has taken a lead position in a consortium composed of a number of notable players such as the World Health Organisation, Karolinska Institute, University of Zurich, Weizmann Institute and Harvard. The consortium, called KENUP, is focused on providing solutions in the field of 'Healthy Living and Active Aging'. The consortium is seeking to obtain EIB support through the EFSI initiative for a number of projects in the field. The most notable projects are related to digital education, adult vaccines and e-Health.

Conclusion

The National ERA Roadmap is a step forward towards building the European Research Area while focussing on Malta's national priorities and needs. The implementation of this Action Plan will be monitored through a mechanism presently being set up. Indeed, Malta is in the process of setting up a National R&I monitoring mechanism for its R&I Strategy and Action Plan. The ERA Roadmap monitoring will be incorporated into this mechanism, particularly in view of the synergies between Malta's National ERA Roadmap and the R&I Action Plan, for which Malta is developing key performance indicators. Malta will also be using the headline indicators endorsed by the Competitiveness Council, since many of these indicators address the overarching priorities and therefore can be applied to National ERA Roadmaps and Action Plans. Malta is fully committed to contribute fully to the implementation of a well-functioning European Research Area through the achievement of the goals set out in the Roadmap.



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